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Essential self-adjointness and self-adjointness for even order elliptic operators. (English)

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The subject of this paper are symmetric elliptic operators on $L^2(\mathbb{R}^n)$, of the form $T = \sum_{0 < |\alpha|, |\beta| \leq m} (-1)^{|\alpha|} D^\alpha a_{\alpha\beta}(x) D^\beta + q(x)$. For the first it is proved that T is essentially self adjoint on $C_0^\infty(\mathbb{R}^n)$ if the $a_{\alpha\beta}$ are sufficiently smooth and bounded and $q(x) \geq -\text{const} |x|^{2m/(2m-1)}$. Then it is proved that such an operator is self-adjoint on $H^{2m}(\mathbb{R}^n) \cap D(q)$ if q is positive and $|D^\alpha q| \leq \text{const} |x|^{1+|\alpha|/2m}$, for $1 < |\alpha| \leq m$. This extends earlier results which had more restrictions on the operator.

Reviewer: G.Gudmundsdottir

MSC:

- 35J30 Higher-order elliptic equations
- 47B25 Linear symmetric and selfadjoint operators (unbounded)
- 35P05 General topics in linear spectral theory for PDEs
- 35P25 Scattering theory for PDEs

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Full Text: DOI

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